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Who Speaks for Microbiology?¹

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In 1952 the accomplished teacher, scientist, and historian, Paul F. Clark, reviewed a half-century of presidential addresses presented at the annual meetings of this Society (5). Dr. Clark divided the talks into six categories, and only three addresses involved public affairs or the state of the Society. It is perhaps a sign of the times that within the recent past, many more presidential addresses have concerned the role of microbiology and microbiologists in public affairs. Such words as "dissonance" (26) and "national science" (13) have been included in the titles. To examine the reason for this, it may be noted that at the close of the first half-century, our Society had a membership of 4,817 with an annual budget of \$66,000; this year, 17 years later, the membership approaches 13,000 with an operating budget of \$1,350,000. This was made possible by the great support of basic and applied research by the federal government and, more important, by an active and progressive group of officers, especially within the membership committee, under the leadership of our secretary, Donald Shay.

Perhaps because of this rapid expansion and the demands of the membership for greater participation in current events and public responsibility, presidents have become more occupied with thoughts toward the future and development of our science rather than with the more historical and philosophical aspects. At the beginning of the second half-century, in 1953, G. M. Dack set the trend with the title "Microbiologists in Transition" (8). This evening my message continues that trend with a rather parochial title, "Who Speaks for Microbiology?" This was purposeful because I sincerely believe that microbiology has become a discipline and a science, and it must be strengthened by making this Society the voice for microbiology.

We are no longer the handmaiden of medicine and agriculture, and we are not to be swallowed into the diffuse area of biological science. This does not preclude cooperation with other biologists; indeed, our contributions will be felt and recognized if we speak from strength within our own discipline. I should like, therefore, to discuss

with you some of the most significant voices of microbiology in the past, present, and future.

In 1903 one of the founders of our Society and of science in America, Dean H. L. Russell of Wisconsin, pleaded for the formation of a publication in bacteriology recognizing that perhaps the most significant voice for this newly created science would be a scientific publication (20). It was not until 13 years later that the first issue of the *Journal of Bacteriology* appeared. After Professor C. E. A. Winslow served with great distinction as the first editor, there followed a succession of outstanding editors who have unselfishly given of their time to build this journal into a publication which speaks well for microbiology. The decision to take over the publishing of our journal and other publications, together with the employment of a full-time managing editor, permitted the Society and its publications to expand not only quantitatively but also qualitatively. As our late distinguished member Barnett Cohen said, "Publication represents the vital stream that nourishes the science; it is also a unifying force in the Society" (7). The splitting off of new journals such as the *Journal of Virology*, which has already become a significant and respected publication, and the recommendation of the Publications Board to launch a new journal entitled *Infection and Immunity*, if approved by the Council, will no doubt represent another significant voice for microbiology.

The establishment and continuity of these journals have identified microbiology as a basic discipline at a time when there is increasing effort to integrate our science into a core of biology. For example, many medical schools are revising curricula in such a way as to cross traditional departmental lines. This has resulted in a de-emphasis of basic sciences, including microbiology, in the new curricula. Thus traditional microbiology is open to attack on two sides—one the attempt to integrate the subject into core biology, and the other to teach the subject concomitantly with the clinical material in a manner comparable to pre-Flexner medical education. At the moment, there are many clinicians with outstanding training in various basic science fields who are highly competent and capable of teaching microbiology to medical students. In the absence of strong basic science departments

¹ Presidential address delivered in Miami Beach, Fla., on 6 May 1969, at the Annual Meeting of the American Society for Microbiology.

within medical schools, however, I doubt that this breed of clinician will continue to reproduce himself, and in time medical education will again acquire the qualities so abhorrent to Flexner. There is need for change in the medical school curricula. Certainly, there must be adequate core and more cooperation not only between the basic science departments but also between the basic science and the clinical departments. At Minnesota, we welcome these well-trained clinician-basic science types into our department, and immediately label them microbiologists! We recruit and apply the same concept to geneticists, molecular biologists, biochemists, engineers, soil scientists, dairy husbandry specialists, dentists, and veterinary scientists, with the recommendation that they become members of the American Society for Microbiology! They develop into excellent microbiologists! It is a tribute to our science that it can accommodate and contribute to these many important areas.

Although I have emphasized the importance of our publications in establishing the firm foundation of our science, I would be remiss not to mention the equally important contributions of our scientific meetings. The recent creation of a Meetings Board, with the chairman sitting on the Council Policy Committee, attests to the significance the Society has attributed to these meetings. Our tax classification does not permit our Society or the Academy to accept tax-free gifts. Our financial well-being, therefore, is derived primarily from the income of the annual meetings. The dedication and industry of local committees are an expression of the spirit of the Society. Within recent years, the ever-increasing responsibility for these meetings has been assigned to our Executive Secretary who, over the years, has served the Society faithfully and with a tremendous sense of loyalty and pride.

Although the two major functions of our Society—publications and meetings—have served us well, and have maintained and established our discipline as a science, within recent years there has been an increasing demand from our membership for more professionally oriented and public spirited activities. The Society has always carried on an active role in educational matters as they pertain to microbiology. Like most scientific societies, we have been somewhat reluctant to depart from the more conservative, traditional roles.

Prior to 1947, there was agitation within the Society to take the lead in certification of professional microbiologists, especially those concerned with clinical microbiology. The history and development of this activity, which finally resulted in the formation of the American

Academy of Microbiology, have recently been reviewed by H. Orin Halvorson (11). Although there were many labor pains, the Academy was definitely born out of the American Society for Microbiology. It was organized as an independent organization primarily because there was mutual agreement that the activities of the Academy might jeopardize the tax-exempt status of the Society. This was not a significant reason because the ASM never enjoyed a rating better than the Academy. We both have C-6 ratings, which unfortunately does not permit either organization to accept tax-exempt funds. [I might digress and point out that the American Chemical Society, under a national charter, enjoys a C-3 rating (3). They have an annual budget in excess of \$20 million with revenues of \$16 million. They have a public affairs committee, and the editors of *Chemical and Engineering News* have strong public affairs editorial policies. They have many funds to which industry can donate on a tax-exempt basis. These go into a general fund and are reallocated to the various functions of the American Chemical Society. I mention these details because many of our members have voted against any type of public affairs involvement for fear of losing our tax-exempt status. It would appear to me that there is ample precedent for our contemplated activities when one considers the activities of the American Chemical Society with a tax status much more delicate than ours.]

The program of the Academy was designed to speak for and profit all of microbiology, but because of its organization there have been financial limitations. Only the senior members of our Society contribute to its support. Just as sound health is essential for an individual's well-being, so must an organization have a sound financial base if it is to fulfill its mission. The parent American Society for Microbiology, because of its broad base, large membership, and various activities, has been able to maintain a strong financial position. We have been fortunate, too, in the selection of our treasurers. Most recently, Boyd Woodruff has given the Society the benefit of his expert knowledge in organization and finance. I mention this now because he has recently informed me that he no longer can continue in this position because of increased commitments. Therefore, he wishes to resign at the end of this term. We owe him a debt of gratitude for his devotion and skill in matters pertaining to our financial well-being.

Within recent years, members of the Council Policy Committee of the Society and the Board of Governors have collaborated to bring the Academy and the Society closer together, both

physically and organizationally. As you know, the headquarters of the two organizations are now in our microbiology building in Washington, under the direction of our newly appointed Executive Director, Asger Langlykke, with Ray Sarber serving as Executive Secretary for both organizations. The members of the Joint Committee, by authority of the Council Policy Committee of the Society and the Board of Governors of the Academy, are proposing to the Council of the ASM and the Fellows of the Academy, at this meeting, a change within the ASM constitution to bring the two organizations into a common administrative unit. I sincerely hope that if these modifications are approved by the Council of the Society and the Board of Governors of the Academy, the membership of the Society and the Fellows of the Academy will ratify these decisions.

Assuming approval, what is the significance for microbiology, and will the union strengthen the voice of microbiology? Within the ASM, the Academy would now represent a third arm of the Society, responsible for professional and public affairs aspects of the profession and the science. There are two main areas to be considered.

One represents certification programs under the aegis of the American Board of Microbiology and the National Registry of Microbiologists. So far, the primary need is in the area of clinical microbiology. The need has been dramatically presented by Morris Schaeffer and his colleagues of New York who published results revealing an appalling situation in the clinical microbiology laboratories in New York. As pointed out in the annual meeting of the Fellows on 30 April 1967, Dr. Schaeffer stated, "It is obvious, therefore, that in addition to appropriate national and local legislation, which should set standards for the practice of clinical and laboratory medicine, delineate the requirements for the education and training of technical personnel at all levels, and prescribe the type and scope of proficiency testing programs, a great effort must be made to recruit and train more individuals capable of providing services so sorely needed in the clinical and public health laboratories across the nation. Both the Academy of Microbiology and the American Society for Microbiology must enter actively into the arena and contribute more than cheers, blessings and words of encouragement. The time and talent of everyone knowledgeable in medical microbiology, quality control, management practices, legislation, education, electronics and automation are needed in every locality, and such individuals working with their colleagues in each state can make invaluable con-

tributions to the cause of laboratory improvements. A national office should be established conjointly by the Academy and the Society with a permanent staff to coordinate work in these areas Never in our history has there been better reason for the existence of the Academy of Microbiology and the Society. Never has the opportunity for accomplishment been more ripe. Now is the time for forceful and appropriate action. If we fail now, we will remain an exclusive social club and a mutual admiration society" (Minutes, Annual Meeting of Fellows, American Academy of Microbiology, 30 April 1967, New York).

On other occasions Dr. Schaeffer has spoken out with equal candor and vigor (21). The officers of the Society and the Academy have listened, and the plans I have outlined are an attempt to create an organization capable of expediting these recommendations.

The second large and even more difficult area with which we must be concerned is public affairs. Our past president, Riley Housewright, in his presidential address entitled "National Science and Microbiology" (13), dealt with an important aspect of this and made suggestions concerning the proper role of microbiology, microbiologists, and the American Society for Microbiology in federal science. After World War II, there was unprecedented support of research. This was particularly true in the health field. We as microbiologists profited greatly from funds received, especially from the National Institutes of Health. We are equally aware, as so ably stated by Philip Abelson, that "A twenty-year honeymoon for science is drawing to a close" (1). We are also aware that the Fogartys, the Lister Hills, and the Shannons pass on. We can have confidence that their successors, the Floods, the Magnusons, and the Marstons will continue, in their own way and within the context of the times, to add significant chapters to the magnificent success story of NIH.

The National Institutes of Health do an effective job in public relations. The compilation "Advancement of Knowledge of the Nation's Health" (2) was a major effort to inform the President, the Congress, and the public.

The National Institutes of Health and agencies such as the National Science Foundation, however, at this particular time, require the assistance and support of the scientific community. The Honorable Lester L. Wolff, speaking on the crisis facing American science, said, "Until recently your journals have been surprisingly silent, and there seems to be no real spokesman for the private scientific sector. As a profession, as an industry, you *cannot* continue to rely on

government agencies and their spokesmen alone. You *must* make yourselves known and listened to in the Congress" (25).

As a result of such admonition, many scientific societies have initiated and expanded their public affairs activities. The American Association for the Advancement of Science has an active editorial policy with excellent writers under its editor, Philip Abelson. D. S. Greenberg has contributed greatly in his interpretation of the relationship between science and government (10). The Federation of American Societies for Experimental Biology has an office of public affairs for the purpose of keeping the membership informed on the current national scene. The American Institute of Biological Sciences has been taking an active role in science and public policy. Its president, William D. McElroy, in a letter addressed to me as your representative, stated relative to the 19th annual meeting of A.I.B.S., "Biologists in attendance assumed an awareness of their role in helping to solve some of the major problems confronting mankind today. Against this background, the A.I.B.S. governing board passed a resolution to hold national biological congresses in 1970, '71 and '72. The first congress will be held in Detroit, Michigan, November 6-10, 1970. The success of this and subsequent congresses will depend upon your active participation." In contrast to much of the material on public policy which is published in the scientific press, where scientists are talking to scientists, Dr. McElroy points out that, "Meetings open to the public will be designed to provide a forum in which the interrelationships of biology, technology, society and public officers are considered. National, state and local leaders will be invited to participate in these public meetings. Among the topics to be considered, for whose solution biological knowledge is vital, are water and air pollution, pest control, population pressures, community health, food quality, and the effect of drugs on human development and behavior. We need your ideas on other topics that might be considered." It should be obvious to all that microbiology has tremendous applicability to nearly all of these subjects. The Council Policy Committee of your Society has officially endorsed these congresses and has instructed the chairman of the Meetings Board to organize subcommittees to expedite our participation in these important events. I sincerely hope that the Society and the Academy will take the lead in speaking for microbiology at these congresses. It is a rare opportunity to debate and have dialogue on the many important issues to which microbiology and microbiologists can make significant contributions.

Finally, within our proposed constitution, how can our Society best represent the science and the profession of microbiology on matters of public policy? Last year, the Committee Advisory to the U.S. Army Biological Laboratories, under the chairmanship of J. W. Moulder, recommended that "our Society give careful consideration to the formation of a standing committee on public policy (or affairs) which would be concerned with the relationship of microbiology to matters of public policy, among them being biological warfare" (16). The Council Policy Committee voted against the formation of such a committee (CPC Meeting, 13-14 Dec. 1968, Bethesda, Md.). I voted with the majority on this issue. The Moulder committee gave cogent arguments for and against the formation of such a committee. They were not unaware of the dilemma created by such a proposal. They stated, "The Advisory Committee has no intention of usurping the responsibility of the Council Policy Committee and the Council for initiating and implementing policy decisions by our Society. We only hope that our report will form the basis of further thoughtful discussion of the question whether the American Society for Microbiology, the largest and only broad based microbiological society in this hemisphere, is to have any voice in questions of national and international policy in which applications of microbiology play important roles." During the year, the Northern California Branch presented an equally thought-provoking statement concerning public information and asked two important questions. (i) "Does the ASM have an obligation to provide the public with scientific information relative to the policy decisions which the public desires to influence; (ii) how should the ASM provide information on these matters to the public?" (4).

I wish this evening to give my personal thoughts on how this can be accomplished within the framework of our proposed constitution, without the formation of a public affairs committee commissioned to establish public policy for the ASM.

Within recent years an outstanding congressman, Emilio Q. Daddario from Connecticut, chairman of the House Subcommittee on Science and Astronautics, has believed that scientific and educational societies such as ours are not sufficiently used as sources for advice to Congress. These views were presented in an address before the Engineers' Joint Council (9). In his statement he points out, "There remains . . . one potentially important source for technical advice that has not been adequately tapped—the professional technical societies. Opinions originating from these sources should be relatively devoid of the vested interests found in government agencies, industry,

and in forthright lobbying. Opinions from society representatives would come from acknowledged leaders acting as professionals and, as such, would reflect the responsibility for the public interest which the term 'professional' implies." He pointed out that societies were set up to facilitate the exchange of research findings and the discussion of research matters. In fact, this tradition is reflected in congressional legislation exempting from taxes professional societies exclusively scientific and educational in their objectives. As science has assumed greater importance to public policy, there is, especially during the past 2 years, a desire on the part of the membership to become involved. Congressman Daddario carefully points out that, "On issues of public controversy, however, there can be no unified and concerted opinion by a professional society. Such a group may have a single voice in factual matters, such as whether an experiment is being performed properly and the results correctly interpreted. But . . . the truly perplexing questions that emerge during public discourses . . . entail information, opinion, and judgments which fall outside the realm of any narrow professional specialty."

Congressman Daddario then asks, "How can a professional society settle issues in science and technology? Certainly, as mentioned above, it cannot do so by emitting firm conclusions and pat answers. A proper approach would be for the societies to *discuss* public issues—through their publications and by means of symposia. Neither the tradition of being narrowly specialized nor the fear of losing tax-exempt status should be allowed to preclude *discussions* by societies on matters of political and social controversy. By attempting objectively to analyze national problems involving science, . . . and by presenting *pro* and *con* arguments for proposed solutions, the societies could help clarify critical issues."

The biological congress concept planned by the American Institute of Biological Sciences would be an excellent platform on which to discuss such issues. I do not believe, and I am sure Congressman Daddario would agree, that the Council Policy Committee of our Society or a public affairs committee should ever be requested to evolve policy attributed to the American Society for Microbiology *for* or *against* such controversial issues as biological warfare or the boycott of Chicago as a meeting place in protest against the actions of Mayor Richard Daley and his police. During this year, the Council Policy Committee was required by petition to make a decision on Chicago as a meeting place. In voting not to boycott Chicago, the Council Policy Committee carefully pointed out that the decision to continue to meet in Chicago did not involve

approval or disapproval of Mayor Daley's actions.

To establish these as controversial issues requires only the reading of letters to the editor of *Science* (14), the recently published books on biological warfare (6, 12), the two nationally televised programs featuring biological warfare (17, 24), and the resulting editorial opinions of the daily press.

I want to make it abundantly clear that I believe the Society must provide for an objective, balanced, professional analysis of such controversial issues either at our branch or national meetings. To do so does not require the Society to adopt an official policy on these matters. We can also carry on such activities in collaboration with our affiliated societies such as the American Association for the Advancement of Science and the American Institute of Biological Sciences.

Congressman Daddario also suggests, "The professional societies could also serve the nation by recommending consultants for Congress to call on for advice. Witnesses would be expected to appear at hearings as individuals to reflect their own personal views. Since the society's membership is made up of professionals who can intelligently discuss their respective specialties, the societies could readily help Congress to locate such knowledgeable and articulate members and encourage their participation in government."

The Board of Governors of our Academy, within the framework of the ASM and with the assistance of the Executive Director, should be able to make significant contributions within these areas of activity.

Still other areas exist where microbiologists could speak for microbiology. Daddario suggests Congress could request reports on technical subjects from the societies. The American Chemical Society is preparing a report on the role of chemistry in waste management and pollution control. Within the NIH, just recently, the National Institute of General Medical Sciences called upon its Microbiology Training Committee (composed of many distinguished members of our Society) to prepare a report on the status of research in environmental microbiology (18). This factual publication points out areas in which microbiologists can and do contribute to the national welfare. The Ecological Society of America has alerted its membership to the importance of speaking out for ecology (2); their president stated, "Because ecologists have tended to abdicate their responsibilities in matters of public interest, eminent scientists in other specialties but without ecological competence have often been able to speak as authorities on important ecological matters without challenge" (15).

In contrast, the participation by the ASM and its recognition by the National Academy of Science and its working organization, the National Research Council, has been disappointing. Perhaps we can be encouraged by the fact that, within the year, the section formerly designated "pathology and microbiology" has been reserved for microbiology. Let us hope that microbiology will be interpreted in its broadest sense so that the distinguished members of our Society who have been honored by election to the Academy will not have to be in botany, chemistry, or some other collateral area. Too, it has been discouraging to note that of the 560 members in the Division of Biology and Agriculture in the National Research Council, there are only 25 members of our Society, and about half of these are associated with other societies (19). There is but a single committee devoted solely to microbiological problems. Our membership has much to offer and our knowledge impinges upon many important problems of major significance to the welfare of our nation. We may expect that under the presidency of Philip Handler, the Academy and the National Research Council will continue a more active role toward utilization of our manpower in the field of microbiology.

Our science transcends national boundaries, and so we extend our question to ask, "who speaks for microbiology at the international level?" Over the years, microbiology has attained stature equal to other sciences because of outstanding and progressive leadership. This is manifest by the fact that microbiology as represented by the International Association of Microbiological Societies was given divisional status in the International Union of Biological Sciences. Our distinguished guest and Office of Naval Research speaker at this meeting, André Lwoff, serves as president of I.A.M.S., and we are proud that the ASM represents the United States in this organization. A tentative reorganization within the International Union of Biological Sciences has been prepared by the executive committee of I.A.M.S. to be approved at the meeting in Mexico City in 1970; virology has taken a real step forward and will be an active section within the division. They held their First International Congress for Virology in Helsinki, Finland, in July 1968, and they will hold their second meeting at the 10th International Congress in Mexico City in 1970. Now that we are placing a greater emphasis on infection and immunity by the initiation of a new journal, *Infection and Immunity*, perhaps we can follow the lead of the virologists and work toward raising immunology from a commission to a section on infection and immunity within our new division of microbiology.

During the past months, Roger Porter, who serves as chairman of our very effective International Activities Committee, and Asger Langlykke, our Executive Director, have been working hard to find sufficient funds to assure U.S. representation at the Third International Conference on Global Impacts of Applied Microbiology, to be held in Bombay, India. This conference will consider contributions which applied microbiology can bring to the economy and welfare of developing nations. For lack of funds, it is conceivable that the U.S. will not be represented at this important event. In the same vein, it is indeed unfortunate that our representative to the International Culture Collection meeting in Japan this year had to find his own funds to assure our representation at that important meeting. It appears that the first items to be cut from research budgets by the National Institutes of Health and other granting agencies is the foreign travel. If our proposed reorganization is ratified, I believe the first order of business of the Council Policy Committee should be instructions to our Executive Director to initiate the formation of an affiliated foundation for the purpose of receiving endowments which will be tax exempt. Indeed, microbiology must have many friends willing and anxious to contribute to such a foundation. One of the uses of such funds could be to assure ASM representation at all international meetings. The international scientific community is a major hope for world peace.

Who speaks for microbiology? Collectively we have a voice in our Society that can only grow stronger as more microbiologists identify with the science. Individually we have the opportunity to contribute scientific and logical appraisals to controversial problems. Finally, within a sane and peaceful world, our discipline and science have much to contribute toward the welfare of man. Let us hope that those who speak for microbiology both at the national and international levels will use their knowledge to fulfill man's great potential for good here on earth.

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